arranged, and many fully worked out in two or more ways. With this short analysis of the contents, we heartily commend the work to teachers generally, assuming, of course, that they will regulate their use of it in proportion to the requirements of age and ability of their pupils. The work is neatly got up, and we have detected hardly any errata. On page 51, ex. 2, we have "How many petals are there in 376 forget-me-nots?" Here there is an omission and a slight technical error. In botanical language the "forget-me-not" (*Myosotis*) is monopetalous, the number of *lobes* of the corolla being *five*.

R. T.

### *Transactions of the Woolhope Naturalists' Field Club for* 1869.

NO slight service has been rendered to the cause of natural science by the numerous naturalists' field clubs scattered here and there through the country, not only in the exploration of the natural products of their respective districts during their summer excursions, but in infusing a love of such pursuits among dwellers in the country. When the transactions of the year are published in so attractive a form as the volume before us, an additional benefit is conferred. The Woolhope Club is one which has been for some years favourably known, chiefly through the labours of one or two genuine naturalists among its members, as having furnished some real contributions to science by its researches among the pleasant woodland county of Herefordshire. The volume consists mainly of lively accounts of the various excursions made by the club during the summer of 1869, with lists of the rarities, zoological and botanical, met with, and reports of the papers read by its members. Among the more important of the latter we may mention Dr. Bull's history of "The Ancient Forest of Deerfold;" and papers on the occurrence and identification of rare birds in Herefordshire and Radnorshire, by Mr. Armitage, Rev. Clement Ley, and Mr. James W. Lloyd, including the peregrine falcon (*Falco peregrinus*), the hobby (*F. subbuteo*), the little merlin (*F. æsalon*), the grasshopper warbler (*Sylvia locustella*), the fire-crested wren (*Regulus ignicapillus*), and the great and little bittern (*Ardea stellaris* and *minuta*). Dr. Bull has given a celebrity to the Woolhope Club for its enthusiasm in favour of edible fungi; there are several papers on the subject, to which is appended Mr. W. G. Smith's *Clavis Agaricinorum*. Several very pretty illustrations ornament the book, among which may be mentioned photographs of some of the remarkable trees of Herefordshire, and a drawing of the famous Deerfold mistletoe-oak.

### *Contributions to Botany, Iconographic and Descriptive.*

By John Miers, F.R.S., F.L.S. Vol. II. (Williams and Norgate, 1869.)

THIS volume will be welcomed as an addition to Mr. Miers' contributions to systematic and structural botany, all of which possess the value of the labours of a careful and accurate observer, and one especially conversant practically with South American botany. We find in this volume carefully worked papers on the *Calyceraceæ*, a small order closely allied to *Compositæ*, on the carpological structure of *Bignoniaceæ*, on the history of the maté plant, and the different species of ilex used in the preparation of Paraguay tea, a monograph of the *Tricuspidarieæ*, an essay on the genus *Goupia*, one on the structure of *Heliotropiaceæ*, and a paper on the South American forms of *Ehretiaceæ*. But the most important article is one on the genus *Ephedra*, which Mr. Miers considers has been improperly placed among gymnosperms, maintaining that it has neither naked ovules nor naked seeds, and believing that it is more allied to *Urticaceæ* than to *Cycadaceæ* or *Coniferæ*, presenting a far higher order of structure than these latter orders. The third volume, devoted entirely to *Menispermaceæ*, is promised shortly.

A. W. B.

## *LETTERS TO THE EDITOR*

[*The Editor does not hold himself responsible for opinions expressed by his Correspondents. No notice is taken of anonymous communications.*]

### Life in the Deep Sea

THE interest which attaches to every fact which bears upon the phenomena of life at great depths in the ocean, will, I hope, excuse me for especially directing the attention of the readers of NATURE to the "Beiträge zur Plastiden Theorie" (published in the fifth volume of the *Jenaische Zeitschrift*), with a separate copy of which my friend Prof. Haeckel has just favoured me.

The longest of the papers which constitute the "Beiträge," is devoted to a careful study of *Bathybius*, and the associated Coccoliths and Coccospheres; and it is a matter of great satisfaction to me that Prof. Haeckel has arrived at conclusions which, in all the main points, agree with my own respecting these remarkable organisms.

In a second paper Prof. Haeckel describes a wonderful Radiolarian, *Myxobrachia*, observed during his stay at the Canary Islands, the further study of which promises to throw a new light upon the nature of the Coccoliths and Coccospheres; inasmuch as bodies of the same character were found accumulated, and apparently developed, in masses at the extremities of certain prolongations of the protoplasm of *Myxobrachia*. As *Myxobrachia* attains a length of half an inch, and seems to be abundant in the harbour of Lanzerote, it is to be hoped that Prof. Haeckel, and other naturalists, will not long remain deprived of the opportunity of submitting it to re-examination.

Another important discovery made public in the "Beiträge," is the existence of starch in the well-known "yellow cells" of the *Radiolaria*. In connection with this fact, it is interesting to remark that all the *Radiolaria* are floating organisms, and, consequently, that they are fully exposed to the light of the sun.

T. H. HUXLEY

Jermyn Street, June 23

### The "English Cyclopædia"

YOUR issue of June 2 contains a long letter from "Nemo," to which a short reply seems desirable. Most of his statements are incorrect, and, as an illustration of the trustworthiness of his facts, or supposed facts, allusion may be made to his remark that all he can find in the Cyclopædia about *Arvicolæ*, *Crociduræ*, *Crossopi*, *Hypudæi*, and *Sorices* is that *Hypudæus* is sometimes spelt *Hipudæus*; whereas all the species mentioned in the Close Time Report to which he refers are described or noticed in the Cyclopædia. The species of the sub-genera *Crocidura* and *Crossopus* are referred to under their generic heading *Sorex* in the article *Sorecidæ*, E. C. Some of the terms which he says are omitted properly belong to another division of the Cyclopædia. Thus *Acclimatisation* is noticed in the Arts and Sciences division, and something additional will probably be given in the supplement to that division. Again, *Deep Sea Dredging* had scarcely become a subject of general interest when the Natural History Supplement was being written, while the character of the principal results, and the probability of great additions to the subject, rendered it advisable, as was thought, to postpone its consideration until the Arts and Sciences division was supplemented. Some of the results are, however, given under *Alcyonaria* and elsewhere in the Natural History Supplement. As regards the other subjects said to be omitted, most of them do occur. *Darwinism* is noticed under *Species*, E. C. S., and also under *Palæontology*, *Crustacea*, &c. *Dimorphism in Animals* will be found under *Annelida*, *Hydrozoa*, *Generations* (*Alternation of*), *Crustacea*, &c., in E. C. S. *Eophyton* is noticed; and *Eozoon* is repeatedly mentioned, while its systematic position is described under *Foraminifera*. The article *Entophyta* in E. C. is devoted to the fungi connected with skin diseases, while those which are associated with ague and other diseases would be most appropriately noticed in connection with those diseases, which do not belong to the Natural History division. A whole column is given to *Hyalonema* under *Alcyonaria*, E. C. S., in which the contradictory views of Drs. Bowerbank, Gray, Wright, and others, are distinctly referred to. Something is said about *Hybridity* under *Primula*. *Ornithoscelida* is not in; the term was first proposed in a paper read Nov. 24, 1869, which paper was not published in the printed form until after the Sup-

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plement had been finished. The general views on *Protoplasm* are given under *Cells*, *Amœba*, and so far as it is identical with Sarcode under *Actinophrys*, *Sarcode*, and other headings in E.C.S. *Rhizocrinus* is referred to under *London Clay*, and its occurrence in the living state mentioned. *Aerolites:* The latest reference is said to be 1861, implying, as it seems, that none of the information is of later date. Falls subsequent to 1861 are mentioned, and many of the facts are of later date; as, for example, those relating to the Alais and Orgeuil aerolites; Sorby's conclusions published in 1865; and Daubrée's experiments, of which accounts were given in 1866 and 1868. The article itself appeared early in 1869. As to the bibliography, the principal authors are mentioned, and a list of the works consulted was written, but was inadvertently omitted. It is also said that the latest reference under *Alca* is 1861, but this again is not correct. The writer of the article *Annelida* was not aware of Claparède's strictures at the time he wrote it; but, after all, they do not seem to affect materially the general statements given in the supplementary volume. Prof. Huxley's views respecting the systematic position of *Archæopteryx* are given under *Birds*, E.C.S. No reference is made to *Protagon* under *Blood*, E.C.S., nor is mention made of Day's colour tests, nor Dr. Richardson's renunciation. Of the last, all that was found in the Reports of the British Association is the title of his paper, which runs thus, "On Coagulation of the Blood; a correction of the Ammonia theory," and of which nothing more is said. Hence it was thought best to say nothing about the matter. Of the long string of terms which "Nemo" has culled from Prof. Huxley's last address to the Geological Society, and which are said to be omitted, the majority are given in the Supplement. For instance, to cite one or two cases: *Anthracosaurus* occurs under *Carboniferous* system, E.C.S.; *Evolution* under *Palæontology; Microlestes* under *Rhætic Beds*; and so on. As to the other remarks which have not been specially alluded to, it may be admitted that some of the articles might have been improved. *Foraminifera* would have been all the better if Haeckel's volume had been consulted, only Haeckel's work could not be got. It would have been very desirable if subjects which have been omitted had been inserted, and if cross references had been more numerous; but there were restrictions as to space which rendered it necessary to make a selection. Thus, *Meloe* was inserted and *Sphegidæ* rejected, because there was no room for both. What a Cyclopædia ought or ought not to contain is an open question. It cannot give information upon everything; and probably very few persons not specially interested in the subject want to know about *Hyænictis* or *Ictitherium*. If regard was had to the theoretical view of the matter, and not to the cost and other practical drawbacks, a full account of all that has been done in the last sixteen years would fill several volumes as large as the Supplement to the "Natural History Division of the English Cyclopædia." I beg to sign myself

THE EDITOR

## Cuckows' Eggs

WHAT is the drift of this discussion on the eggs of the cuckow? Is it "natural selection," "mimetic analogy," or what? Are we to understand that by some process of "natural selection" the European cuckow can change the appearance of her egg to that of the selected foster parent? or that one set of cuckows lays eggs like titlarks, let us say, another like hedge-sparrows, and so on; and always select each its particular nest in which to deposit its particular coloured egg?

If this is it, *cui bono?* Of course to deceive the foster parent. Is this needed? I doubt it. I do not think the foster parent cares what coloured eggs she sits on, so long as they are about the size of her own, so as not to inconvenience her.

Let us see what cuckows do in other countries, and let me select Africa as my field. If deception is necessary in one country, why not in another? Le Vaillant is so inaccurate that one must take all his statements *cum grano*, but he is right in some things, where, I suppose, he had no temptation to go wrong. He says of *Cuculus gularis* "that its egg is olive grey, dotted with red" (gris olivacé, piqueté de rouge), and that it is laid in the nests of—1, the Jean Frédérick (*Bessonornis phœnicurus*); 2, Corypheé (*Bradypterus coriphæus*); 3, Traquet-patre (*Pratincola pastor*); 4, Pie-griéche fiscal (*Lanias collaris*); and 5, Bacbakiri (*Telophonus bacbakiri*). Now the eggs of No. 1 are of a dirty white or buff ground, more or less spotted with pale rufous; 2, a lovely verditer, irregularly blotched with brown; 3, also verditer, indistinctly clouded with brown; 4, pale grey, blotched at the obtuse end with greenish and reddish spots; 5, light blue, profusely spotted with brown.

*Cuculus solitarius*, he says, lays its pink egg, dotted with clear brown spots, in the nests of—1, *Bessonornis phœnicurus;* 2, *Bradypterus coriphæus;* 3, Le Capocier (*Drymoica capensis*); 4, Le Réclameur (*Bessonornis vociferans*); and 5, Le fauvette à tête rousse. The eggs of the last two I do not know; those of the first two are described above; those of No. 3 are blue, with brown blotches.

*Oxylophus edolius* and *O. melanoleucus* he confounds together, but it matters little, as the eggs are alike—pure white—and deposited in nests of—1, Bergeronette brun (*Motacilla capensis*); 2, *B. coryphæus;* 3, Gobemouche mantelé (*Tchitrea cyanomelas*); and others, whose eggs I do not know. Of 1, the eggs are greyish white, or rather nankin, minutely freckled with brown; of 3, they are cream-coloured, profusely spotted with red, brown, and purple spots, in a band at the obtuse end. One of my correspondents finds eggs of *O. edolius* in the nests of *Pycnonotus capensis*, whose eggs are rather deep lake, profusely spotted with dark markings! They also, I know, lay in the nests of *Pycnonotus nigricans*—eggs as of the last. I found Mud-birds (*Malacircus bengalensis*) in Ceylon, feeding a young *O. melanolewcos*, and their eggs are of a uniform deep verditer.

*Chalcites auratus* lays white eggs also, and some of my correspondents have sent what I *believe* to be their eggs taken from the nests of *Hyphantornis capitalis*, whose eggs are green, profusely speckled with brown, and dark salmon-colour profusely speckled and spotted with dark brown and black.

Now, will any one say, after comparing these different cuckows' eggs with those of the nests in which they have been found, that there is any attempt at imitation, and if not in so many cases, why in that of *C. canorus?*

I used to think and so I wrote ("Birds of South Africa," p. 252) that the eggs of parasitic birds "usually resembled those of the foster parent." This was my idea founded on statements concerning the European cuckow taken from books; but a valued correspondent, taking exception to my position, set me to investigate the subject for myself, and to collect together and analyse my own observations and those of my collectors in this country. She writes as follows:—"The eggs of all the cuckows that I have met with in this country (South Africa) are white, and moreover they are nearly always larger than the eggs of the bird in whose nest they are deposited. With regard to distinguishing eggs, birds of all kinds are exceedingly short-sighted. We used to amuse ourselves by changing the eggs in all the birds' nests we knew of. The owners seldom left them, but took to the strange eggs; and unless their habits were remarkably different, they would blindly rear each other's young, just as they do the young cuckows. It is not necessary, therefore, for nature to make this provision. My second son once filled a Cape canary's nest with so many eggs that when the young were hatched they were more than the poor birds could manage to provide for, and having repented of his mischief, he was obliged to help them bring up their young." (Cf. *Ibis*, 1868, p. 247.)

Since this was written, I have had the advantage of visiting my correspondent, who is well known throughout this colony for her talents, love of natural history, and powers of observation. We often discussed this subject. She and her sons assured me they never cared to select eggs like those of the foster-parent, but simply eggs of those whose food they knew to be similar. They said the confusion they caused was most amusing, but only after the young were hatched. The eggs were incubated without any demur on the part of the foster-mother. After this, surely I may ask *cui bono* the *C. canorus* imitation?

E. L. LAYARD

Cape Town, Cape of Good Hope, May 3

## The Chromatic Octave

I HAVE to thank "M. A." for his letter in NATURE of June 9th, suggesting that the wave-frequency to which the complementary of any tint is due, may be, not the geometric mean between that tint and its octave, as I suggested in a letter in NATURE of 28th April, but the harmonic mean. I can scarcely doubt that there must be some simple arithmetical relation between the wave frequencies of any tint and its complementary,

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